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R E M A R K S

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Mr. T H O M A S H E N R Y's

Improved Method of Preparing

M A G N E S I A A L B A.



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REMARKS

ON

MR. THOMAS HENRY



Imprinted by

MAGNÉSIA ALBA

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Dr. Pearson

R E M A R K S

O N

Mr. THOMAS HENRY'S

Improved Method of preparing

MAGNESIA ALBA;

With an easy Chemical Process for procuring it, in the
utmost Perfection, without leaving any gritty Re-
mainder.

To which is added,

An A P P E N D I X.

By a PHYSICIAN.

K

L O N D O N:

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Judicio perspicaci
Georgij Pearson M.D:
viri admodum eruditi;
tam in Medicinæ notitia
quam in bonis litteris
versate,
testamen hæc, qualecunque est,
lubenter submittit:
Ejusque olim urbanitatis
non inmemor,
gratissimè dabo



Auctor

R E M A R K S

On an improved Method of making MAGNESIA ALBA; with the solution of a chemical problem, hitherto unresolved. "To decompose EPSOM SALT; and collect the whole of its earthy basis free from admixture."

IT is some time since I drew up a few observations on Mr. Thomas Henry's improved method, as he styles it, of making *magnesia alba*, with a full resolution of having them submitted to the consideration of the *College of Physicians*; but my correspondent, near town, being greatly out of health, they were never presented that I heard of. This accident almost determined me to drop my design of making them public; and had not a tiresome controversy, between the *Oxford*

and *Manchester* preparers and venders of this article, very disinteresting to the community in general, pestered us almost incessantly from the press, I should scarce have resumed the subject.

It appears very satisfactorily, from several letters favoring Mr. *Henry*, accompanied with a recital of some experiments in point, that Mr. *Glasse's*, or *Delamotte's* preparation is not free from calcareous earth; owing, most probably, to the hard water of *Oxford* made use of in that concealed process: And Mr. *Thomas Henry's* extolled improvement of the *Oxonian* method, which he does not know, is nothing more, in his own words, than a miserable contrivance to wash off the impalpable particles of an imperfect body, not destitute of saline *moleculæ*, from its coarse or gritty remainder; although the original process is manifestly intended to make a compleat separation of the absorbent earth contained in a given quantity of *Magnesia* Glauber-salt, from its natural acid, divested of all heterogeneities, or adventitious admixture;

admixture ; or, in other words, to produce an insipid, impalpable powder, not convertible into quick lime by the action of fire, or calcination, from a perfect analysis of *Epsom* salt ; which powdery substance, when thus obtained, is again reducible to a salt, similar in all respects to the *sal catharticus amarus* of the shops, as Dr. Black observes *, with the proper addition of a weak vitriolic acid. All other attempts, therefore, to procure it free from *tartarum vitriolatum*, and every impurity beside, how near soever they may approach perfection, do but give us strong indications, at the best, of an inacquaintance with the chemical constitution of the substance to be decomposed ; and gross ignorance of a known principle in chemistry as well as *physics*, whereon the solution of numerous natural no less than artificial *phænomena* depend.

HENCE, however, it may be easily explained why Mr. *Glass*, the first advertising

* *Essays and Observations, physical and literary*, 8vo. Edinburgh 1770, vol. ii. p. 181.

preparer of this medicine, was pleased to call the making of it a capricious business *, whilst his adversary, equally inexperienced in chemical matters, applies a certain, but strange remedy to the confessed defect, by throwing the grosser or gritty part of the mingled produce away, as his own improved manner of preparing it informs us †.

DR. Black, in his experiments upon *magnesia alba*, quick lime, and other alkaline substances ‡, mentions some trials of the purgative power of *magnesia* upon firm constitutions, when combined with a small vegetable acid, like that in weak stomachs; having previously supplied us with the outlines of a process for procuring it in a state of purity from *sal catharticus amarus*, the bitter of the salt pans, or a spurious *Glauber salt*, shot in large crystals, and sold under

* Essay on *Magnesia Alba*, by Samuel Glas, surgeon, Oxford, p. 12.

† Medical Transactions of London, vol. ii. p. 230.

‡ Essays and Observations, physical and literary, vol. ii. p. 172.

the denomination of *Lemington*, where it is made in considerable quantities. This he calls a short sketch of the history and medical virtues of *magnesia* *; from whence, of course, we are not to expect great accuracy; although he advises, for a reason afterwards given, to make the mixture *just to boil over a brisk fire*†. It is evident, nevertheless, in his animadversions upon this occasion, that he was well aware, from a thorough knowledge of the chemical structure of *tartar. vitriolat.* whether formed by an adventitious union of its principles or otherwise, that washing off or dissipating it, which could not be dispensed with, in point of utility more than elegance, must be attended with uncommon difficulty; and he has expressed his sentiments in terms sufficient to awaken the attention of an intelligent chemist. To use his own words ‡. “The alkali in the “mixture,” says he, “uniting with the “acid, separates it from the *magnesia*; which

* *Essays and Observations, physical and literary, vol. ii. p. 172.*

† *Idem, p. 177.*

‡ *Idem, p. 178.*

" not being of itself soluble in water, must
 " consequently appear in a solid form. But
 " the powder which thus appears is not in-
 " tirely magnesia; part of it is the neutral
 " salt formed from the union of the acid and
 " alkali. This neutral salt is found upon ex-
 " amination to agree in all respects with vi-
 " triolated tartar, and requires a large quan-
 " tity of hot water to dissolve it. As much
 " of it is therefore dissolved as the hot water
 " can take up, the rest is dispersed through
 " the mixture in form of a powder. Hence
 " the necessity of washing the *magnesia* with
 " so much trouble; for the first affusion of
 " hot water is intended to dissolve the whole
 " of the salt; and the subsequent additions of
 " cold water to wash away this solution.

" THE caution given," adds our author,
 " of boiling this mixture is not unnecessary;
 " if it be neglected the WHOLE of the *mag-*
 " *nesia* is not accurately separated at once;
 " and by allowing it to rest for some time,
 " *that* * powder concretes into minute grains,

* See our general Observation at the foot of the process.

" which

" which, when viewed with a microscope,
 " appear to be assemblages of needles diverg-
 " ing from a point." Thus far Dr. Black.

HENCE it appears, by fair induction,
 from the known principles of *Epsom salt*, to
 mention no other, disunited by a ~~vitriolic~~ *fixed*
Alkali, &c. that the minute grains, taken no-
 tice of in the latter part of the Doctor's cau-
 tion for just boiling the mixture, are very
 small particles of *tartarum vitriolatum* in fact,
 of which more in the sequel, closely ad-
 hering to, or entangled in the *magnesia*
alba. These saline *moleculæ* too, it is evi-
 dent, which are so prejudicial to the ele-
 gance, and indeed to the absorbent virtue of
 the medicine, were never intirely dissipated,
 or washed off from the powder, in a chemi-
 cal manner, either by the *Oxford* or *Man-*
chester operator, notwithstanding their several
 claims to superiority and perfection. They
 have indeed blotted reams, I had well nigh
 said of paper, upon this favorite theme, to
 very little purpose more than vilifying one
 another, to encourage the sale of their com-
 B modity,

modity, like contending dealers in the same petty article of traffic. One of them however, Mr. *Henry*, has presented his process, like a man of ingenuity, to the *College of Physicians*, and called it “An improved Method of preparing *Magnesia Alba* *;” but without seeing any other, it appears, than what is contained in Dr. *Black*’s Essay, which is not given to us, manifestly, as an exact prescription.

UPON this improved method of preparing *magnesia alba*, it is meant to remark in the subsequent part of our short treatise; wherein some errors and defects in reasoning upon the subject, as well as on the manner of the preparation, will be examined into in part; a less exceptionable mode of procuring *magnesia alba* from *Epsom* salt instituted, in lieu of Mr. *Henry*’s, upon the fundamental principles of rational chemistry; a compleat analysis of the bittern of the salt pans, *sal catharticus amarus*, or spurious Glauber salt;

* Medical Transactions, vol. ii. p. 226.

which

which are only so many names for the same thing, will be exhibited; and an undeniable manner of proving the genuineness, and purity of its absorbent earth shewn, by an easy experiment upon the substance thus produced, in a calcined, or an uncalcined state.

In the perusal of Mr. *Henry's* improved manner of preparation, inserted in the 2d volume of *Medical Transactions*, we meet, throughout the whole of it, with no striking intimations, or serviceable hints, to facilitate or amend the process. It only contains a general unmasterly instruction, never announced indeed before, how to separate the impalpable particles of *magnesia alba* from its grosser *moleculæ*, by repeatedly agitating and decanting off the mixture in a turbid state; leaving us, at the same time, altogether in the dark as to the cause of a difference respecting its elegance and simplicity, frequently observed by comparison with a purer sort than either the *Oxford* or *Manchester*, and not very difficult to be accounted for by persons tolerably conversant in the doctrines of pharmaceutical chemistry,

chemistry, which do not extend far. Although this inferior branch of the science, not without its advantages, requires a degree of chemical knowledge and address in the management of natural concretes for medical purposes, all have not attained who wish perhaps to write themselves *adepts*. Hence some commendation is due to the assiduity of those humble labourers in the furnace, who have, by dint of application, so far subdued the impediments to a compleat analysis of *sal catharticus amarus*, which has perplexed numbers, as to be able to collect the whole of its absorbent earthy basis free from admixture, or the adhesion of any heterogeneous particles, saline as well as others. For this may be justly esteemed an amendment of the methods in practice. How far Mr. Henry has succeeded in his attempt to improve upon the ordinary manner of preparing the *magnesia alba* made use of in the shops, and obtained, as Ingram and others pretend, by a peculiar process, from the waters of Epsom, will be best understood from the directions in his own Essay, which, it must be confessed, afford

afford us no exalted idea of his chemical genius.

It would be wasting time, to give an account, in detail, of the chemical combination and decomposition of saline concretes generally, or of that body in particular, from whence the *magnesia alba*, in such vogue at present, is always procured for medical purposes; or to weary the reader with a solution, in form, of their artificial alterations, synthetical or analytical, from the doctrine of *affinities*, or *relations* of particular substances to each other, as *Macquer*, and other writers, after *Geoffroy*, affect to denominate chemical attraction *; or that power which disposes bodies of the same nature to unite; and exerts its influence amongst the constituent parts

* Elements of Chemistry, vol. i. p. 12.—This hint for the reduction of technical terms, will not perhaps be relished by numbers. There are, no doubt, who may think it necessary to distinguish precisely, by some apt word or epithet, between the reciprocal tendency of the integrant and constituent parts of a body. But suppose aggregation, mixture, and composition, which include integrant and

parts of compounded substances in such a manner, under fit circumstances, as to disunite them, and form new compounds: From whence, if rightly deduced, we are enabled to discover the constituent particles of most chemical results, and acquire a probable pre-conception of their medical effects in a variety of instances. Disquisitions of this kind however, more apt to introduce unprofitable debates concerning the propriety of terms, &c. than to promote the progress of

and constituent, *i. e.* all created matter, to depend for the union of its parts upon the same physical principle, as facts, where they can be traced, inform us; there can be no cogent reason methinks for the use of different terms to express the same *idea*.

If then to the *technical* terms *gravitation*, *cohesion*, *magnetism*, and *electricity*, admitted in our philosophy, we should add CHEMISTRY, which is only another species of the same *genus*, ATTRACTION; would not all nature, agreeable to the immensity of Divine *Wijdom* be reduced, in this respect, to the utmost state of simplicity? Would not the resolution of natural as well as chemical *phenomena* be thence more readily, if not more scientifically explained? And would not our progress in many of the useful parts of natural knowledge be remarkably expedited by thus judiciously pruning exuberant distinctions?

useful

useful knowledge; and totally foreign to the matter in hand we shall omit, and only examine two or three particulars of the last proposed method for producing fine *magnesia alba*, laid down in the papers already referred to *.

AFTER premising, with great reason, that the proper method of making *magnesia* is very little known, Mr. Henry proceeds, with a stricture or two, not well considered, upon Dr. Black and the *Edinburgh College*, to describe his own excellent manner; which produces a medicine, he tells us, free from all grittiness, and always equally pure, white, tasteless, light, and impalpable; nay sometimes superior to the *Oxford* preparation †. But be that as it may; these criterions of goodness, drawn from the colour, insipidity, lightness, and subtility of the body, to say no more about them, are frequently observed in substitutions and sophistications; conse-

* See p. 9.

† Medical Transactions, vol. II. p. 229.

quently not to be depended upon, as tests of that medicinal virtue which has purchased *magnesia* an esteem, and very deservedly, above many other absorbents of the galenical tribe, with men of abilities in the profession. Its only valuable characteristics then, as an useful internal application, especially amongst young children, are genuineness and simplicity: Qualities, one may very readily discover it will soon appear, and of all others the most desirable; seeing *magnesia alba* is prescribed, with so much constancy, in disorders occasioned by four humours affecting the stomach and bowels; whereto adults, enervated by disease or debauchery, as well as children at the breast, are highly obnoxious. The extremely sensible, and moveable *fibrillæ* of infants, for instance, are easily disturbed, and convulsive twitchings excited, by a continuance of irritation, or repeated stimuli offending the stomach or alimentary canal, for want of a safe remedy to correct and carry off redundant acidities acting in the *primæ viæ*; and that too without the risque of clogging them, as when loaded with testaceous or cretaceous

cretaceous substances, whose parts being naturally more cohesive, will not so readily disunite, and are, besides, incapable of forming an opening neutral salt with weak fermented acids, as will be remarked hereafter.

IN order then to establish a postulate of some importance to the physician as well as patient, the following ocular proof of its perfection, known not improbably to several good practical chemists, will evince the truth of what has been asserted, while it furnishes an incontestible argument in favor of the purity and genuineness of the substance intended to be examined.

The P R O O F.

NEUTRALIZE any quantity of a dilute spirit, or phlegm of vitriol as the chemists call it, with *magnesia alba*, and if the *magnesia* be pure, you will obtain a bitter, purging compound, perfectly resembling the bitter separated from culinary salt, or a limpid solution, of *sal catharticus amarus* in clean water, without any saline concrete or earthy

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residuum;

residuum; supposing the menstruum cold, and in no large quantity. This liquor evaporated to a pellicle, and set in a cool place to shoot, will produce a salt similar in all respects to Epsom salt *, from whence it was originally dislodged.

THE first part, however, of the experiment just recited, will be sufficient to shew what is intended by it, namely, a proof of the simplicity and goodness of *magnesia alba*; because there is no mineral earth beside, if we except an earth obtained, in very small quantity, from the mother liquor of rough nitre, which is an absorbent of the same nature, that will form a bitter purging liquor with vitriolic acid †, resembling the solution of *Epsom* salt in water, or the bitter waters of Scarbrough, and other purging springs, im-

* The waters of Scarbrough, and other bitter purging springs, are found by experience to contain no inconsiderable quantity of this salt, as I have repeatedly shewn by experiments, upon Scarbrough water particularly.

† See Dr. Newman's Chemical Works abridged and methodized; with large additions by Dr. Lewis. Quarto, London 1759, p. 190, Notes.

pregnated

pregnated with a similar kind of saline concrete. Hence it follows, that the essential characteristic of *magnesia alba* may be certainly discovered, without much loss of time, and very nearly free from expence. Considering its utility therefore, and the great call there is for it in all quarters, this test of purity ought to be every purchaser's first care who designs to administer it as a safe, powerful corrector, and an evacuator of prevalent acidities; from what cause soever they proceed. All other trials are apparently fallacious, or insignificant.

AND since this celebrated powder has been found, by long experience, to constitute a gently opening, saline body, when united with weak vegetable, as well as strong mineral acids, while the substituted sorts in particular, similarly combined, become astringent, or destitute at least of an opening property; the necessity of proving its genuineness, before we venture to prescribe it in cases of offensive acidities, is too obvious to need longer insisting upon. It may not be amiss, notwithstanding,

standing, to remark by the way, that all calcareous or animal earths, how indissoluble soever in a vitriolic acid, find solvents, though not very ready, in the muriatic, &c. from whence they have been occasionally precipitated, and passed, very injuriously, upon the unwary, for true *magnesia alba*. Specimens of these I have seen, and detected a shameful variety, amongst the common preparers and disposers of the article.

HENCE, from what has been already advanced, and other arguments to the same purpose which might be brought, it is reducible almost to a demonstration, that neutralized saline concretes possess very different, and indeed opposite medical properties, according to their respective solvents, though combined with the same solvent acid; as in *alum* and *Epsom salt*, the one astringent, the other purgative; constituted nevertheless by the union of a vitriolic acid and distinct earths. It will not therefore, I hope, be deemed an impertinent trespass to add, by way of corollary, in this place, for the sake of those who may

may not have been fortunate in frequent opportunities to make observations of this nature, or have not perhaps paid them a proper regard, that the very different qualities of these substances, and many others, vitriolic as well as meerly saline *or earthy*, too numerous to insert in this little essay, seem altogether deducible from their several bases, or solvents, according to the chemists, and not from the solvent acid, or menstruum, wherewith they are naturally, or artificially combined, whether noxious or innocent, to say nothing of their medicinal properties. Chemistry abounds with examples of this kind. To instance in a few. Common green copperas, blue or white vitriol, sulphur, Glauber salt, alum, selenites, *sal catharticus amarus*, *tartarum vitriolatum*, *turbith mineral*, &c. formed by the coalition of the same acid of vitriol with different metals, salts, earths, &c. *to wit*, iron, copper, zinc, phlogiston, mineral and vegetable alkali, quicksilver, argillaceous or calcareous earth; and the absorbent earth of most bitter purging waters, as Epsom, Lemington, Scarborough, &c.

now

now commonly known by the name of *Magnesia Alba*; which, like part of the substance obtained from the mother ley of rough nitre, is not of the calcareous kind, as observed before, or convertible into quick lime by the action of fire *, Dr. Black has proved, from a careful calcination of it for an hour at least, in a degree of heat sufficient to melt copper †: and yet these various substances, known to be possessed of very different properties, are all formed of the same mineral acid.

BUT to return. Mr. Henry, however fortunate in availing himself of some useful hints from a celebrated preparer of the most genuine

* *Magnesia alba* differs from calcareous earths in two remarkable properties. One is, that it is not convertible into quick lime, the true criterion of earths of the calcareous kind; the other, that it dissolves readily in the vitriolic acid, into a limpid bitter purgative liquor; whereas all calcareous earths concrete with that acid into an insipid dissoluble selenite; and all the other earths that dissolve in it form austere, styptic compounds.

Newman abridged by Lewis, 4to. p. 205, Notes.

† Essays, physical and literary, vol. ii. p. 189.

magnesia,

magnesia, does not seem to have disclosed †, agreeable to his *professed intention*, an improved method of preparing that useful medicine, whatever advantages the fine and saleable part of it may have reaped by a separation from the gross or unsaleable, by decantation, which he could not, according to his method of management, otherwise divest of its vitriolated tartar: neither has he assigned any plausible reasons for Mr. *Glass's* failures, although the *Oxford* preparation did not pass unobserved, as being less perfect at one time than another: From whence we are of course to infer, I suppose, that Mr. *Glass's* successes, according to Mr. *Henry's* censure, when his results excelled, were in the main but accidental, though happy events. And to say the truth there is not much room, upon mature deliberation, to dispute the conclusion. It may nevertheless be equally well applied to one of them as to the other *,

† Medical Transactions, vol. ii. p. 228, 229.

* See Essay on *Magnesia Alba*, by Samuel Glass, Oxford 1764, p. 12, 13, and Mr. Henry's Essay, in the 2d vol. of Medical Transactions, p. 229, 230.

for, without any further testimony than a cursory perusal of their several productions, it is evident that these gentlemen, when they ventured to publish their thoughts upon the subject, were not sufficiently informed of the constitution of *Epsom salt*, produced naturally by the coalition of vitriolic acid and a peculiar kind of absorbent earth, without any indissoluble admixture or heterogeneity; nor of the nature of that artificial saline concrete, formed in the analysis of bitter purging salt by the affusion of a vegetable alkali which has given them so much trouble. Had this leading object of inquiry, necessary to an improvement of the process, been pursued with effect, it would have saved an infinite deal of altercation, and rendered these observations and annexed process, such as they are, wholly superfluous; the cause of a material imperfection and impurity, particularly complained of in the *Oxford* preparation, but ill explained by Mr. *Henry*, would not then have been so egregiously mistaken, or supposed insurmountable by the powers of chemistry, as the method of separating the finer parts of
the

the magnesia from the coarse, after the *Manchester* manner, must incline one to imagine: neither would our improver have so sanguinely recommended the means of amendment published in his little tract; at least he would not have introduced it to the *College*, I am thoroughly persuaded, as the *coup de maître* of his process. For, compliment apart, it has not the cast of art to give it colour; nor, to be brief, would the true reason of that stiffness, coarseness, grit, and I might add slight bitterness, often complained of in very ill collected *magnesia alba*, have escaped our improver's observation. It offers, almost *prima facie*, to a chemical inquirer, that this principal defect grittiness, in the produce, can be attributed only to an adhesion of minute undissipated particles of *tartarum vitriolatum* to the absorbent earth, as will be proved hereafter, formed in disuniting the acid, and powdery substance, by means of a strong alkaline ley, and not, as suggested improperly, to a deposited *selenites*, sparingly dissoluble in an aqueous menstruum, and easily discharged from it according to the ob-

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servation

servation of Dr. Lewis *, should an operator be necessitated at any time to make use of hard spring water in washing the powder, which rarely happens, except at Oxford †.

AND if, the more strongly to enforce what has been urged already, and to demonstrate, as it were, the necessity of an alteration or amendment in the very unchemical conclusion of Mr. Henry's improved process, we do but reflect a moment upon the boasted measures proposed for separating the impalpable powder from its grosser *moleculæ* or grit, by strongly agitating, and pouring off

* The offending ingredient in hard spring waters, is a combination of an acid and earth, &c.

Newman's Chemical Works, by Lewis, p. 249, Notes.

† The indissoluble part of selenites, consisting of an acid and calcareous earth, wherewith hard water is impregnated, precipitates very freely, upon decomposition, by the affusion of a fixt alkali, in a white impalpable powder, not wholly unlike *magnesia alba* in its appearance. This powdery substance, therefore, cannot be supposed to communicate a roughness to the magnesia, how prejudicial soever it may prove in other respects, from its astringency, &c. when combined with a weak fermented acid, in the stomach or bowels.

the

the impalpable particles of the absorbent earth from its coarse or gritty parts, after due ablution, while the mixture is in a turbid state, in imitation of the whiting makers, for the sake of collecting, not the whole, like them confessedly, but as much as possible of pure *magnesia alba* for sale, we shall not, I presume, have occasion to adduce any other arguments.

THE experienced chemist, though not an adept, who has sometimes accompanied, or pursued, invariable Nature through her more retired walks, can never certainly entertain the least idea of an *improvement* which consists merely in leaving any part of an adventitious body behind, natural or artificial, connected with part of his medicine, however small, for want of chemical skill to comminute and disperse or dissipate it, as strongly recommended by Dr. *Black* in his short sketch: for upon that point materially, our author tells us, the perfection of the process depends*. And yet, that the case stands

* *Essays and Observations, physical and literary, vol. ii. p. 179.*

thus, we are instructed in the latter part of Mr. *Henry's* method, where he prudently advises the operator, after the liquor has lost its saline taste *, “ to let it be so agitated as
 “ to suspend the finer parts of the powder ;
 “ in which state,” says he, “ decant it into
 “ another vessel, and having separated the
 “ water from the *magnesia* by inclination,
 “ put it on large chalk stones until a considerable part of the humidity is absorbed ;
 “ then lap it up in sheets of paper, and dry it
 “ before the fire ; pour hot water upon the
 “ remaining powder, stir it, decant it in its
 “ turbid state, and separate the *magnesia* as
 “ before ; by these means,” *that is, by leaving the grit behind,* “ the whole, or most
 “ of it, will be reduced to an equal degree of
 “ fineness.”

SUCH a method of reduction, where the artist's skill makes no appearance, may perhaps answer the lucrative purposes of sale well enough ; but it can lay no claim to a

* Medical Transactions, vol. ii. p. 230, &c.

chemical device, much less to an improvement upon Mr. *Glass's*, or any other decent manner of preparation, in the loosest sense of the word. It may serve too, there is no doubt, to separate all, or very near it, of the *magnesia alba*, that has been disentangled from the neutral salt, mentioned by Dr. *Black*, and pass perhaps upon the less skilful part of the profession, as an eminent *working* chemist once observed to me, for a stroke of ingenuity.

BUT the chemical problem nevertheless, or really improved preparation, promised in the front of this work, "to decompose *Epsom* salt, and collect the whole of its earthy basis, free from admixture of the new saline concrete *tartarum vitriolatum*;" or, in other words, to procure perfect *magnesia alba* without grit, or a remainder unfit for sale or prescription, continues unaccomplished in Mr. *Henry's* improved process, maugre all that has been repeatedly said to make us believe it a preparation superior sometimes to his antagonists, the Oxonians.

THIS

THIS *desideratum* it is the principal aim of the present essay to supply; and I do not altogether despair of making some progress in the matter, at least of throwing so much light upon the subject, as may enable gentlemen of better talents to finish what has been hitherto enterprized in vain, to the lasting reproach, it may be said, of the science, and its disappointed cultivators: I mean a real improvement of the general, and what is deemed, at this day, the best method in practice of producing elegant *magnesia alba*, from a compleat analysis or decomposition of *sal catharticus amarus*. And if the method here laid down, differing in some respects from the last and only promulgated manner of conducting the process, upon principles truly chemical, as I hope they are, though short of perfection, should meet a favourable reception from readers of understanding in the science, who are always the most candid, I shall neither regret the time nor application it has required to investigate attentively the chemical structure of *Epsom salt*, and the invariable effects of a pure alkali upon its acid solvent. For without

out these *præcognita* there would be no possibility of giving certainty to any method of obtaining *magnesia alba* in full proportion, and free from all impurities, consonant to the operations of nature ; whose exquisite designs, though imperceptible to the short-sighted eye of humanity, are planned and executed with infinite wisdom and simplicity ; those indelible signatures of Supreme perfection.

AND here give me leave, having ventured thus far, to take notice generally, that the same power which preserves the planets within their respective orbs, and contributes its share in the orderly return of the seasons, is not less manifest in its operations amongst the primary parts of *aggregates*, *mixts*, and *compounds* ; and every increased order of their *moleculæ*, more the objects of imagination than of our senses. Although these minute particles of matter, it must be acknowledged, are subject to no settled laws or limitations in respect of distance, as in gravitation, &c.

In a word, *the vis attractrix, qua omnes materiæ partes a se invicem trahuntur*, according to Dr. Friend *, which runs through the whole system, and presents itself incontestibly in the analysis of every compounded or mixt body, may be justly admitted the *sine qua non* of speculative chemistry. For hence the reasons of almost all chemical *phænomena*, as well as many others are deducible, without multiplying causes unnecessarily to explain obvious effects. Spagiry therefore, like medicine, which may be stiled, without impropriety, the useful handmaid of Nature, should not be perplexed with unavailing distinctions, or even complicated terms †. Yet how often are the researches of younger students retarded, and their ideas confounded, by a crowd of unmeaning epithets, as *elective*, *double elective*, *specific*, and the like, much better understood by the simple addition of superior, stronger, &c. to the term attraction. Such marks of precision, however, are too frequent

* *Prælectiones Chymicæ*, p. 6.

† See p. 11, and the note.

even amongst men of letters, though they tend rather to obscure than enlighten the road to real knowledge. But I desist. Those reflections fall improperly, I am conscious, from the pen of a practical writer, who admits of no theory, except what may be fairly drawn from truths established by experiment, speaking rather to the eye than to the ear; nor presumes to arrogate to himself the authority of a dictator of terms, principles, or opinions, either in language or the sciences.

The problem, or process for analysing sal catharticus amarus, and collecting the whole of its absorbent earthy basis, or impalpable powdery principle, without any foreign admixture. *

I. Make a strong lixivium, of picked pot-ash, or *cineres clavellati*, soft and white, in hot water. Strain, or rather filter the saturated solution whilst hot. Let it stand in an earthen jar some days, to deposit its redundant alkaline, or less soluble particles, which will soon subside, or perhaps crystalline in

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part;

part ; and you will have a pure, saturated, limpid, alkaline ley fit for use.

II. Dissolve a quantity of *sal catharticus amarus* in the proportion of one pound of the salt to near two pints at least of water, that the aqueous menstruum may not be too highly impregnated with *sal catharticus* ; for the process has been always observed to answer better in a dilute, rather than a saturated solution of the purging salt. Strain or filter this liquor likewise, and let it stand quiet for a few days, till it becomes limpid.

III. With a small quantity of each of these prepared solutions, (No. I, II.) examine precisely as possible, what weight or measure of the alkaline ley (No. I.) will be sufficient to dislodge the whole of the absorbent earth, without waste, contained in a given measure of the saline liquor, (No. II.) from its vitriolic acid ; for the advantage of the preparation depends greatly upon accuracy in this chiefly neglected particular.

IV. To

IV. To any quantity of the solution (No. II.) boiling upon the fire, pour a just proportion of the lixivium, (No. I.) found by the directions given, (No. III) as hot at least as boiling water can make it. Stir them very briskly for some time, or rather, as Dr. *Black* advises, “*mix them accurately together by violent agitation**,” without removing them from the fire; and let the mixture be kept boiling briskly as long as any lumps are to be seen; that is, until it exactly resembles new milk in colour, and apparent homogeneity, which will not take up much time. Then throw the whole, in this state of ebullition, into a large quantity of boiling hot water †, and stir them well together. As soon as the powdery substance has settled to the bottom, decant off the clear liquor, and supply it, *immediatcly*, with a fresh washing of boiling water. There will be very

* *Essays and Observations, physical and literary, vol. ii. p. 177.*

† The *Edinburgh Pharmacopœia* directs *eight times the quantity*; but so much, in my manner of preparation, was never found necessary, neither does it seem practicable in a large way.

little, if any occasion, after this, for many more washings, hot or cold, to divest the *magnesia* totally of its neutral salt, or adventitious *tartarum vitriolatum*. This part of the process, however, depending upon little circumstances, or oversights, not always to be obviated at first with equal ease, how expert soever the operator, cannot be exactly determined. Nevertheless, if not egregiously mistaken in my own remarks, they will scarce give a tolerable chemist much trouble to reduce to a degree of certainty; if possessed especially of a moderate share of knowledge in the practical part of the art.

OBSERVATIONS.

ANY remarks upon Mr. *Henry's* annotations at the foot of his process, much of a piece with the improvement, may be thought unnecessary. Permit me however to note that it is not THE powder, as erroneously remarked by Mr. *Henry*, which concretes into minute grains, but *moleculæ* of *tartarum vitriolatum*, imperceptible to a naked eye, involved in *magnesia alba*, that occasions the grittiness,

grittiness, so deservedly complained of, and distinguished in Dr. *Black's* Essay by * THAT powder. The particle *that* evidently importing it to be *that* part of the powder or powdery substance *magnesia*, that is not accurately separated at once † from the saline spiculæ, or small particles of the new formed neutral salt indisputably, which appear in their loosely connected state, by the assistance of a microscope, *like assemblages of needles diverging from a point, as observed before ‡*. It may be true that these concretions, not wholly saline it appears, cannot be *redissolved*, for obvious reasons, by any washing, however long continued; if the rules nevertheless delivered in the foregoing process be duly observed, they may be compleatly dissipated or dispersed, as suggested by Dr. *Black* in his ingenious dissertation, and repeatedly experienced in the preparation itself, conducted after the manner already described in this paper.

* See page 7. And page 20 in the notes; where Dr. *Lewis* has used this particle in the same sense exactly.

† Page 6.

‡ Page 7.

As our procedure however for obtaining pure *magnesia alba* differs materially from the method laid down in the Medical Transactions *, it may not be amiss to give some reasons for each step of the process, submitted with all due deference to the candid correction of judicious readers.

I. A full quantity of fixed vegetable alkali is directed in preparing the lixivium, to make a saturated ley, perfectly free from other saline particles, often discovered in the best pot ash, capable of crystallization, or not readily dissoluble in an aqueous menstruum †.

II. It is recommended to use a dilute solution of *sal catharticus amarus*, lest the vitriolated tartar, formed in the analysis of bitter purging salt, when both solutions are fully impregnated with saline matter,

* Vol. ii. p. 226, &c.

† *Vitriolated Tartar*, says Dr. Black, always accompanies the fixed alkali of vegetables. *Essays, physical and literary*, vol. ii. p. 223. A circumstance deserving attention, though not taken notice of by any other chemical writer.

though

though in a state of ebullition, or near it, should not be accurately separated at once, agreeable to Dr. Black's caution*, from its redundancy; and the liquor, of course, not so readily reduced, if at all, by boiling; for want of sufficient menstruum, into an apparently homogeneous fluid like milk, as delivered in the process. For while any particles of the *magnesia alba* envelop, or adhere to a number of particles of *tartarum vitriolatum*, not yet disunited or thoroughly dissolved, it gives the appearance of lumps. These must be carefully reduced. The elegance, ease, and perfection of the process rest materially upon this point, for different reasons. Besides saving a number of ablutions, it never fails to make the whole medicine equally pure, soft, white, tasteless, and much superior to any preparation, in all these respects, I have ever seen: Neither does it leave the least gritty, or coarse remainder to be thrown away, as in the *improved manner*.

* Essays, physical and literary, vol. ii. p. 179.

III. It is to be remembered that sufficient boiling, subject to no limitations or restrictions in point of time, for reasons delivered (No. IV.) of the process, is requisite to disunite the particles of vitriolated tartar, and prevent them from adhering too firmly, as without care they are apt to do, to the powdery substance or *magnesia*; whence its coarseness. For a similar reason, likewise, the solutions are directed to be mixed in a state of ebullition, or as near it as possible, that the minute *moleculæ* of *tartarum vitriolatum*, thus kept from uniting with each other, or with any particles of the *magnesia alba* by the violent action of the liquor in boiling, may be more compleatly separated, and with fewer ablutions; perhaps dissipated in part by the coction of a mixed fluid rather denser than water *. The absorbent earth, thus cautiously disentangled from its saline particles,

* Among the properties of vitriolated tartar enumerated by Dr. Lewis, are these. It is very difficultly soluble in water, being scarce at all acted upon by cold, and requiring a large quantity of hot water.—Dissolved in water it proves
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particles, will subside free from all impurities, or heterogeneous admixture, in a white, impalpable, tasteless powdery body. And this substance when dried, where no *straining* or particular address but cleanliness is demanded, broken into pieces, and packed up in boxes, is the celebrated *magnesia alba* so justly extolled, when prepared as it ought to be, for its medicinal virtues; and fit for regenerating *sal catharticus amarus*, by dissolving in the phlegm of vitriol, as it will, without leaving any saline or earthy recement at the bottom of the vessel; or even discolouring the clearest water. This proves at once, and is the truest test of both its principal characteristics, *purity* and *genuineness*, Q. E. E.

N. B. In the last edition of the Edinburgh *Pharmacopœia*, which did not fall into my hands till part of these sheets were printed off, is inserted a prescript for making

in part volatile by the heat in which water boils; by strong continued coction it may at length be totally dissipated along with the watery vapour.

Newman's Chemical Works, by Lewis, 4to. p. 190, Notes.

magnesia alba, borrowed of Dr. Black, with very little alteration; and though greatly superior to any publication of the kind, it differs in some particulars from the preceding process; especially in mixing equal quantities of the solution and lixivium, made in double quantities of water, which must tend to make its produce various; for the same quantity of pot ash rarely produces, by this means, a ley of equal strength twice together, as in our method, which gives a saturated solution, and of course a lixivium, of the same strength at all Times.

PROCESS for procuring *magnesia alba*
—from the Edinburgh *Pharmacopæia*.

TAKE a pound of Epfom salt, and as much pot ash; dissolve these separately in double the quantity of hot water; strain or otherwise depurate the solutions; then mix them, and add immediately four gallons of boiling water; let the liquor boil a few minutes, and be well stirred together: This done, suffer the whole to rest till it is something

thing cooler, and then strain off the water through a linen cloth. The magnesia will remain behind ; which must be washed as long as any saltiness is discernible in the water, or rather till it becomes insipid.

I have only to add, as an apology for the errors or omissions discoverable in these *remarks*, which I fear will be many, that they were thrown together somewhat hastily, as opportunity served, for the benefit of the public ; whose advantages, collectively taken, are consulted, I apprehend, in whatever tends to promote the health and well being of any part of the species. Hence it follows that no community can be totally disinterested in a matter immediately respecting the medicinal management of young children, exposed in their infant state, strictly so called, more than in any other, to such alarming disorders as demand assistance out of hand. The usual diseases too of this period generally find relief, it is observed, in a prudent application of mild absorbents, convertible into cool aperient salts, when combined

with weak fermented acids, as experience instructs us. Upon this principle, genuine *magnesia alba* is intitled, unquestionably, to a first place in the Materia Medica. Nor is this all. The properties of this medicine differ in many respects besides, from testaceous or cretaceous substances, no less favourable to the diseased. They are not liable, for instance, to form incrustations in the first passages, where they meet with no corroding or dissolvent acid, like other absorbents, whose particles being of a more adhesive nature, do not separate with equal ease. These valuable qualities however, marking this species of earth in a peculiar manner, are not confined we learn, from very respectable authorities, to the mineral kingdom*.

IN order therefore to preserve the energy of this medicine, and prove its perfect preparation within the bounds of chemical resolution, such rules are laid down in the foregoing part of the present Essay, as will

* See Newman abridged by Dr. Lewis, 4to, page 190 in the notes,

scarce suffer a discreet operator, with a moderate share of practical knowledge, to mistake either in the process, or trial of its goodness as delivered at length page 15. And if by thus contributing my mite to the large stores of medical improvements, I am not refused the approbation due to a well-meant intention at least, my expectations will be fully answered. I have exerted my slender abilities, in a small matter, to serve the helpless part of our fellow-creatures, when most obnoxious to a train of disagreeable, and sometimes fatal consequences, from the inconsiderate use of an ill-prepared or adulterated medicament of any denomination; and in none more evidently than in the abuse of that remedy which has been the subject of the present paper: And my hope is, that amongst the few hints dispersed through these sheets, the practising chemist will be able to select some to his purpose; which, I venture to flatter myself, will be found, upon examination, not wholly insignificant to the profession generally, respected as an art subservient to the uses of medicine.

A P P E N -

A P P E N D I X.

AFTER what has been advanced, it may seem superfluous labour perhaps, with the bulk of our readers, to extend a work, sufficiently tedious already, considering the nature of the subject.

THE method of preparing *magnesia alba*, and of proving the purity of it in an uncalcined state, have been disclosed in the body of this performance, whence nothing further remains, it may be said, except to describe the manner of trying its genuineness when calcined, which scarce differs, materially at least, from the known mode of examining the common sort, delivered page 15.

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THIS appendix, however, is annexed with some other views. It is not meerly calculated to elucidate and confirm what has been urged in the practical part of the foregoing Essay, but to assist us, as I hope it will, in discovering, with some degree of accuracy, the proportion of calcined or uncalcined *magnesia alba* contained in a given quantity of Epsom salt; with some particulars beside, unmentioned before, and not wholly useles, it is presumed, to a competent understanding of the subject before us. I shall therefore beg leave to trespass a moment longer on the reader's patience, with an experiment or two upon each kind of *magnesia alba*, however trifling they may seem to gentlemen thoroughly acquainted with the doctrines of chemistry.

ALTHOUGH it appears very evidently, from Dr. Black's Experiments, that calcination does not alter the nature of pure *magnesia alba*, as it does of calcareous earths; there is too much reason to suspect a latent acrimony communicated to it by the force of fire, and discernible only, it seems, from internal application to very moveable systems, of infants especially;

especially ; as observed in the blood and juices of animals, where it is found necessary, to a certain degree, to stimulate the vessels, according to Dr. *Smith* *. Of this suspected quality, finding no hint in Dr. *Black's* ingenious Essay, designed for other purposes, it is meant, before we conclude, to give some account.

EXPERIMENT I.

I MIXED two grains of uncalcined *magnesia alba* in half an ounce, apothecaries measure, of clean river water, run through a body of sand, and free from calcareous earth, it appeared by the affusion of a strong alkali, which did not occasion the least cloudiness. Nine or ten drops of spirit of vitriol, composed of one pound averdupois of the oil or strong spirit of vitriol, and a pint, wine measure, of water, were added to the mixture. This quantity of spirit just described, neutralized and dissolved, with a strong effervescence, the whole of the *magnesia alba*, without leaving any remainder, into a lim-

* Nature studied, 8vo, p. 68.

pid liquor of a slight bitterish taste, but very inferior, in this respect, to the common solution of a given weight of *Epsom* salt in twice as much water. But this difference appeared to be owing to the smallness of the quantity of neutralized *magnesia* dissolved in the aqueous menstruum.

IN order therefore to obtain a more exact similarity of taste between the solution of a stated quantity of *sal catharticus amarus* in water, proportioned to two grains of pure *magnesia alba*, neutralized with nine or ten drops of the vitriolic acid, as mentioned above, and an equal measure, viz. half an ounce of water, I made the following experiment. With what further intention will be seen hereafter.

EXPERIMENT II.

OBSERVING, from the produce of repeated preparations of *magnesia alba*, that a quarter of a pound, *averdupois*, of the absorbent earth when dry, was obtainable from a pound weight of the purging salt, that is to

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say, that one-fourth of the natural concrete was pure *magnesia*, I dissolved eight grains of *Epsom* salt, supposed to consist of two grains of uncalcined *magnesia*, or absorbent earth and fixed air, and six grains of acid and water, as estimated before, in half an ounce of clean river water. Comparing this solution with the liquor of the last experiment, made of pure *magnesia*, acid, and water, I could not find the least difference either in the taste or appearance of them: The bitterness in each was intense alike: They were equally bright, limpid, and free from all sediment. Hence what has been asserted before, page 15, respecting the trial of *magnesia alba*, in order to prove unexceptionably the purity of it, was confirmed in the present experiment, upon *magnesia alba*, made according to the process inserted page 31, &c.

EXPERIMENT III.

WITH calcined *magnesia* which had lost about $\frac{1}{2}$ of its weight in calcination.

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I took the same quantity, two grains, of calcined *magnesia*, which was rather whiter than the uncalcined, and mixed it with half an ounce of pure river water. It required double the quantity, or near it, viz. 18 or 19 drops of the same acid that was made use of in the first experiment, to neutralize it. But this *magnesia*, as remarked by Dr. Black and others, after repeated trials, was dissolved without any the least degree of effervescence, in the vitriolic acid *. It required however much more time, with this acid, than the uncalcined *magnesia*, and on that account perhaps, to make a compleat solution.

THE compound liquor, thus made, scarce differed at all from the former, except in taste. It was much bitterer indeed than the other; owing, as I imagined, and it afterwards appeared, to the great loss of air, &c. in calcining, whereby it was reduced to less than half its original weight in an uncalcined state. Hence, as *magnesia* seems to

* Essays, physical and literary, vol. ii. p. 189.

consist of absorbent earth and air, almost in equal proportions, which last, of no singular use in this medicine, was carried off by the action of the fire, there will not be any difficulty in accounting why a double quantity nearly of acid was found necessary to neutralize two grains of calcined *magnesia*, or almost as much more as was employed to neutralize the common or uncalcined sort, of the first experiment.

EXPERIMENT IV.

DESIROUS, notwithstanding, to confirm, in some measure, a suggestion, concerning the superior degree of bitterness of the last solution, supposed to arise from a greater proportion of absorbent earth contained in the calcined *magnesia*, double almost to what is found in the common, I dissolved sixteen grains of *sal catharticus amarus*, twice the quantity used in the second experiment, in half an ounce of water, and compared this solution carefully with the liquor of the last experiment, consisting of two grains of calcined *magnesia*, neutralized, in the same quantity

tity of water. They agreed very minutely, in taste and appearance, like the two former, and made good whatever was imagined about the respective quantities of acid requisite to neutralize calcined and uncalcined magnesia.

HENCE, besides furnishing an indisputable proof of the genuineness of each substance, promised in the beginning of this Essay, and giving the reason why it demands so much more acid to neutralize one sort than the other, we learn that the composition of uncalcined *magnesia alba* is principally, nay almost wholly fixed air and virgin earth, found in the ashes of vegetables, says Dr. *Lewis**, as well as in bitter purging salts, with some particles of volatile salt, according to Dr. *Black's* experiments, and a small quantity of an inflammable substance, proved by the superior degree of whiteness of calcined magnesia; if all colour be derived, as chemical philosophers maintain, from this principle. The water, and perhaps a small por-

* Newman abridged, 4to. p. 190, 478 Notes.

tion of *magnesia* forced from it in calcining, are omitted here, as out of the road of our inquiries.

N. B. It is observable that fixed air contributes nothing to the absorbent quality of *magnesia alba*; for the calcined body required near twice as much acid, quantity for quantity, to convert it into a bitter purging salt, as the uncalcined sort. The reason of which, and why it does not take up quite double the quantity of acid in neutralizing, may be traced from the hints given in the preceding page, compared with Dr. Black's experiments *.

THERE is no dismissing this subject, however, without taking notice that in the disorders of very young children, mentioned page 14, accompanied with gripings, green stools, &c. the uncalcined *magnesia alba* may give less uneasiness in some habits, perhaps than the calcined, although the fact I

* Essays and Observations, physical and literary, vol. ii. p. 190.

presume

presume will not be admitted. An instance of this kind, notwithstanding, we have in the following history of a child not full three months old, and of a costive habit, troubled with a redundancy of acid humours or cru-
 dities in the bowels. The calcined *magnesia* was directed, after a successful use of the common fort for some time. I was informed, having prescribed a few doses, by the nurse and attendants, that the last medicine, meaning the calcined *magnesia*, did not agree so well as the other, and that it occasioned a sensible uneasiness upon taking. An event so very unsuspected excited my curiosity, and led me to pay a more strict attention to its effects. In order therefore to clear up some doubts which naturally offered, from a little reflection, I directed the several kinds of *magnesia* alternately, not unapprised of their different absorbent powers; and in such manner too as might most unexceptionably answer the end of my inquiries. Convinced at length of the truth of what had been intimated, by reiterated proofs of the
 fact,

fact, I was obliged to desist from all further use of the calcined *magnesia*.

GENERAL conclusions, it is universally allowed, are not to be drawn from a few facts, much less from single truths. A little incident like the present, may serve, nevertheless, to shew the mistake of determining *a priori*, or too hastily, upon the effects of a medicine, from the knowledge of its structure; or action out of the constitution, *idiosyncrasy* not considered.

THAT *magnesia alba* is not convertible into quick lime by the action of fire, is evident from Dr. Black's experiment: neither does it acquire an acrid taste from calcination he tells us, nor make any the least change in water, though digested for some hours *. It differs nevertheless, we find, from uncalcined *magnesia* in some respects; particularly in sweetening lime water; which is accounted for from

* Essays and Observations, vol. ii. p. 190

its being incapable of supplying the calcined calcareous earth, or quick lime, suspended in an aqueous fluid with fixed air ; which unites, experiments prove, more readily with a calcareous earth, than with the earthy substance of *magnesia*. Yet how far calcined *magnesia* may contribute, from an irritating power, not discoverable in the internal uses of the uncalcined, to disturb the moveable fibrillæ of infants, or even the very unstable solids of enervated adults, is hitherto undecided.

SOME Gentlemen of the faculty have given calcined *magnesia alba* the preference, I am not insensible, in flatulent disorders, a common consequence of indigestions, and hypochondriac affections, on account of its being destitute of fixed air, with which the common fort abounds. And it may, in that view perhaps, have many advantages : but whether it will not in some very moveable systems, as observed before, prove equally, if not more prejudicial by an irritating power ; of which, from what has been remarked, though but in one instance, it does not appear to be wholly

wholly void, must be left to time and further experience.

THE preceding history; therefore, unsupported as it is, and of course not to be greatly relied upon, will lead us, I hope, as in our first trials of all medicaments, to a sparing application of calcined *magnesia*, until we are thoroughly informed of its inoffensive qualities. What evils attend the too bold prescriptions of an untried remedy is self-evident. And in all doubts concerning the active properties of particular substances, natural or artificial, on the human frame, we can hardly be too circumspect. It is a matter of real importance to the patient, and can never be wholly indifferent, methinks, to a prescriber. Hence no suggestion experience warrants, be the physician's character and situation as it may, should be neglected; and I humbly presume, from the present prevalent disposition, which appears almost universal, amongst gentlemen of the faculty in favor of practical intimations, that some regard will be paid to the trifling

trifling incident recited in these Remarks, which were neither dictated by vanity, nor published from any other motive than a desire of being useful, *pro virili*, to the community in general.

This work was almost compleated when an advertisement appeared in one of the public papers, observing, that Mr. *Henry's* manner of preparing *magnesia alba* had been read before the College of Physicians, and was inserted in the Medical Transactions.

BUT is it to be concluded from hence, as insinuated, that Mr. *Henry's* method of proceeding, because it has a place in their useful collection of essays, is esteemed by these gentlemen an improvement of Mr. *Glass's* process, or any other which has not been presented to them? It should seem otherwise.

THE College candidly declare they do not, as a body, mean to vouch for the truth of any relation, or to give authority to any opinion, contained in their papers. And it would, in-

deed, be totally inconsistent with the nature of their design, to take upon themselves the burthen of supporting claims to approbation, or pre-eminence, from any quarter.

As to Mr. *Henry's magnesia* being examined and recommended, by the faculty in general; or any gentleman in *particular* obligingly giving a permission to declare his approbation of it, in both states, as excellent in its kind, the author of these Remarks has nothing to object; but he thinks it might be of singular use to the public to explain a position involved in some obscurity, and shew us why calcined *magnesia alba* is of ALL purgative medicaments the best for patients labouring under the stone or gravel, “especially if taking the soap ley.”

WAVING needless inquiries into the chemical constitution of this lixivium, with a number of particulars arising from the consideration of quick lime, and its use in giving a more active *lithontriptic* virtue to fixed alkaline salts, we shall only bestow a plain observation

servation upon *magnesia* generally, as the properest purgative in those cases where it is so strongly recommended.

Magnesia alba, calcined or uncalcined, we learn from experience, superior to all visionary *hypotheses*, is an aperient only eventually, *quatenus* an absorbent; which when combined with acids in general, expressly mentioned by the celebrated *Hoffman**, or with weak acid humours prevalent in the *primæ viæ*, constitute a soluble salt, repeatedly taken notice of in the course of the preceding treatise. It is not preferable in other respects to testaceous or cretaceous substances, except being less liable to form incrustations in the stomach or bowels, of infants especially, where it meets with no fit solvent necessary to convert it into an opening salt†.

BE it admitted, however, as highly probable, although it wants proof, that the fixed

* Observat. physico-chem. Hal, 1722, p. 118.

† See Dr. Cullen's Lectures on the Materia Medica, p. 478.

air contained in uncalcined *magnesia alba*, and separated in the *primæ viæ* by means of an acid solvent, will affect the caustic alkali, invested, according to some writers of character, with strong *lithontriptic* powers; and diminish its activity on the human calculus, or any sabalous matter collected in the kidneys, ureters or bladder; it still remains to be proved that, in disorders of this class, the first passages are necessarily charged with redundant acidities: For hence alone the propriety of administering *magnesia alba*, in any state, as a solutive substance, can be well maintained. But reason and experience discountenance the suggestion.

WHERE gentle evacuants are indicated, which often happens in this class of morbid affections, the cautious physician, for obvious causes, has recourse to oily emulsions, diluent decoctions, emollient glysters, manna, cassia, &c. which tend to lubricate the urinary ducts, and keep the body in a soluble state, imprudently trusted to uncertain applications,

cations, where the symptoms are urgent, for fear of disagreeable consequences.

It is a known truth, that the frequent nauzeas, sicknesses, and vomitings attending obstructions of the kidneys or ureters, occasioned by fabulous collections or small stones in the pelvis or its continuation, from a consent of parts, or connexion between the stomach and abdominal viscera *, are not uncommonly relieved with oily mixtures, diluting drinks, and easy but certain *ecceopretics*, without any material assistance from anodynes, which are rarely required in the access of these complaints, if the symptoms be not severe. And solutive substances with emollient glysters, fomentations, *semicupia*, &c. seem judiciously directed in such a situation of things, to make room for passing small stones or gravel from the kidneys to the *vesica urinaria*. They relax the neighbouring parts, and ease the intestinal tube, at the same time, of its superabundant contents.

* Cullen's Lectures on the Materia Medica, p. 9.

Unanimi consensu, apud medicos, emollientium et lubricantium remediorum usus, ad faciliorem expulsionem calculi renalis, laudatur, says the learned **BARON VAN SWIETEN**, in his judicious comment on **Dr. Boerhaave's** *Practical Aphorisms* *.

BUT granting the patient under a strict course of soap ley, after all other means of relief have proved ineffectual; Are casual evacuants the most eligible? ought they to be preferred, upon loose conjectures, to such gentle solutives as the practice of ages has approved? or is *magnesia alba*, regardless of the kind, ever rightly administered, as a purgative, ere it be decided whether the stomach and bowels can furnish acid humor to neutralize and dissolve so much of this absorbent earth as will serve the prescriber's purpose?

AN answer to these questions offers itself so readily to every capacity, that it would be paying the reader's understanding an ill compliment to suppose one necessary here.

Vol. 5, p. 303



T H E E N D.

E R R A T A.

Page 7, l. 6, for vitriolic acid, read fixed alkali.—Page 20, l. 7, of the note, for selenite, read selenites.—Page 54, l. 19, for in sweetening, read in not sweetening.